WHAT IS CLAIMED IS:

1. A dispersion compensation module comprising:

a polarizer having a first port, a second port, and a third port;

a reflection etalon; and

a quarter-waveplate positioned between the reflection etalon and the second port of the polarizer.

2. The dispersion compensation module of claim 1, wherein the dispersion compensation module is operable to apply a group delay profile to at least one optical signal.

3. The dispersion compensation module of claim 1, wherein the polarizer is operable to redirect a first optical signal having a first polarization input at the first port to be output from the second port and to redirect a second optical signal having a second polarization perpendicular to the first polarization input at the second port to be output at the third port.

4. The dispersion compensation module of claim 3, wherein the reflection etalon is operable to apply a group delay profile to the first optical signal output from the second port.

5. The dispersion compensation module of claim 1, wherein the polarizer is operable to rotate a polarization of the first optical signal output from the second port by 45 degrees and allow the first optical signal to propagate toward the reflection etalon, the quarter waveplate for rotating a polarization of an optical signal reflected back from the reflection etalon by a further 45 degrees into a second optical signal having a second polarization perpendicular to the first polarization and allowing the second optical signal to be input at the second port of the polarizer.

6. The dispersion compensation module of claim 1, further comprising:

one or more single polarization collimators coupled to the polarizer quarter wave plate etalon assembly.

7. The dispersion compensation module of claim 1, further comprising:

a tuner coupled to the reflection etalon, operable to adjust a resonant frequency of the reflection etalon.

8. The dispersion compensation module of claim 7, further comprising:

a controller coupled to the tuner and operable to control the tuner.

9. The dispersion compensation module of claim 7, wherein the tuner is a heater.

10. The dispersion compensation module of claim 7, wherein the tuner is one or more electrodes.

11. A dispersion compensation module for applying a desired group delay profile to at least one optical signal, the dispersion compensation module comprising:

a plurality of etalon assemblies, each etalon assembly for applying a group delay profile to the at least one optical signal, each etalon assembly arranged so that the at least one optical signal passes at least once therethrough, each polarizer quarter wave plate etalon assembly comprising:

a polarizer having a first port, a second port, and a third port, said polarizer for redirecting a first optical signal having a first polarization input at the first port to be output from the second port, said polarizer for redirecting a second optical signal having a second polarization perpendicular to the first polarization input at the second port to be output at the third port;

a reflection etalon arranged for application of a group delay profile to the first optical signal output from the second port; and

a quarter-wave plate located between the reflection etalon and the polarizer, for rotating a polarization of the first optical signal output from the second port

by 45 degrees and allowing said first optical signal to propagate toward the reflection etalon, said quarter-wave plate for rotating a polarization of an optical signal reflected back from the reflection etalon by a further 45 degrees into a second optical signal having a second polarization perpendicular to the first polarization and allowing said second optical signal to be input at the second port of the polarizer.

12. A dispersion tolerant receiver module comprising:

a dispersion compensation module comprising;

a polarizer having a first port, a second port, and a third port;

a reflection etalon; and

a quarter-wave plate located between the reflection etalon and the second port of the polarizer; and

a photodetector coupled to the dispersion compensation module.

13. The receiver module of claim 12, wherein the photodetector is a PIN-TIA.

14. The receiver module of claim 12, wherein the photodetector is an APD-TIA.

15. A wavelength tracking apparatus comprising:

a beam splitter for receiving an optical signal from a dispersion compensation module, and for outputting a reference optical signal and a monitoring optical signal;

a reference photodiode for receiving said reference optical signal;

a monitor etalon for transmitting the monitoring optical signal;

a monitor photodiode for receiving an optical signal transmitted by the monitor etalon; and

a controller operable to adjust a frequency shift of a group delay profile of the dispersion compensation module using a ratio between a power of optical signals on the monitor photodiode and a power of optical signals on the reference photodiode.

16. A dispersion compensation module comprising:

an etalon assembly pair comprising

a first etalon assembly including;

a first polarizer having a first port, a second port, and a third port;

a first reflection etalon; and

a first quarter-waveplate positioned between the reflection etalon and the second part of the polarizer; and

a second etalon assembly including:

a second polarizer having a first port, a second port, and a third port;

a second reflection etalon; and

a second quarter-waveplate positioned between the reflection etalon and the second part of the polarizer;

wherein, the third port of the first polarizer is coupled to the third port of the second polarizer.

17. The dispersion compensation module of claim 16, wherein the first polarizer is operable to redirect a first optical signal, having an initial polarization, input at the first port to be output from the second port and to redirect a second optical signal, having a polarization perpendicular to the initial polarization, input at the second port to be output at the third port.

18. The dispersion compensation module of claim 16, wherein the second polarizer is operable to redirect a first optical signal, having an initial polarization, input at the third port to be output from the second port and to redirect a second optical signal, having a polarization perpendicular to the initial polarization, input at the second port to be output at the first port.

19. The dispersion compensation module of claim 16, wherein the dispersion compensation module is operable to apply a group delay profile to at least one optical signal.

20. The dispersion compensation module of claim 16, wherein each reflection.

21. The dispersion compensation module of claim 16, wherein each polarizer is operable to rotate an initial polarization of an optical signal output from a second port by 45 degrees and allow the optical signal to propagate toward each reflection etalon, the quarter waveplate for rotating a polarization of an optical signal reflected back from the reflection etalon by a further 45 degrees into an optical signal having a polarization perpendicular to the initial polarization and allowing the optical signal to be input at a same second port of each polarizer.

22. The dispersion compensation module of claim 16, further comprising:
a single polarization collimator coupled to port one of each polarizer.

23. The dispersion compensation module of claim 16, further comprising:
a reflector coupled to the second etalon assembly.

24. The dispersion compensation module of claim 16, further comprising:
a tuner coupled to each reflection etalon and operable to adjust a resonant frequency of each reflection etalon.

25. The dispersion compensation module of claim 24, further comprising:
a controller coupled to each tuner and operable to control each tuner.

26. The dispersion compensation module of claim 24, wherein the tuner is a heater.

27. The dispersion compensation module of claim 24, wherein the tuner is one or more electrodes.

28. The dispersion compensation module of claim 16, further comprising:
a plurality of etalon assembly pairs, wherein a first port of a each etalon assembly pair is coupled to a first port of a another etalon assembly pair such that an optical signal

can be directed to input at a first port of a first etalon assembly pair of the plurality of etalon assembly pairs and output at a first port of a last etalon assembly pair of the plurality of etalon assembly pair.